

2011-1098

United States Court of Appeals
for the Federal Circuit

COGNEX CORPORATION and
COGNEX TECHNOLOGY & INVESTMENT CORPORATION,

Appellants

v.

INTERNATIONAL TRADE COMMISSION,

Appellee,

and

MVTEC SOFTWARE GMBH and MVTEC, LLC,

Intervenors.

*On Appeal from the United States International Trade
Commission in Investigation No. 337-TA-680.*

**NON-CONFIDENTIAL BRIEF OF INTERVENORS
MVTEC SOFTWARE GMBH AND MVTEC, LLC**

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CERTIFICATE OF INTEREST

Counsel for Intervenors MVTec Software GmbH and MVTec, LLC certifies the following:

1. The full names of every party or amicus represented by me are MVTec Software GmbH and MVTec, LLC.
2. The names of the real parties in interest are MVTec Software GmbH and MVTec, LLC.
3. MVTec Software GmbH and MVTec, LLC are non-governmental corporate parties. MVTec Software GmbH is not owned by a parent corporation. MVTec Software GmbH owns 10% or more of MVTec, LLC's stock.
4. The names of all law firms and the partners and associates that have appeared for MVTec Software GmbH and MVTec, LLC before the United States International Trade Commission or are expected to appear for MVTec Software GmbH and MVTec, LLC are: Foley & Lardner attorneys Matthew B. Lowrie, Aaron W. Moore and Kevin M. Littman, and former Foley & Lardner attorneys Larry L. Shatzer and Veronica S. Ascarrunz.

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The material omitted on page 7 describes a performance evaluation of MVTec's accused software. The material omitted on pages 9-12, 14-16, 19-22, 28, 31-33, 38-39, 43, 47-48, 51-53 describes the operation of MVTec's accused software. The material omitted on pages 53-54 describes business activities performed by Omron.

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STATEMENT OF RELATED CASES

No other appeal from United States International Trade Commission

Investigation No. 337-TA-680 was previously before this court or any other appellate court.

There is a pending district court action that may be affected by this Court's decision in the pending appeal: *Cognex Corp., et al. v. MV Tec Software GmbH, et al.*, 1:08-CV-10857 RGS (D. Mass.). The patents-at-issue in this appeal, U.S. Patent Nos. 7,016,539 ("the '539 Patent") and 7,065,262 ("the '262 Patent"), are also asserted in the district court case, along with seven others.

STATEMENT OF JURISDICTION

The United States International Trade Commission (“the ITC”) had jurisdiction under 19 U.S.C. § 1337. The ITC entered a final determination of no violation on November 16, 2010. (A1-5.) Cognex filed a Notice of Appeal on December 2, 2010. (A1265-76.) This Court has appellate jurisdiction under 28 U.S.C. § 1295(a)(6).

STATEMENT OF THE ISSUES

1. Did the ITC correctly find no violation of the '539 patent, based on any one of the following issues:

1.a. Did the ITC properly find no infringement of the '539 patent, based on lack of "an accept threshold," which is not dependent on any claim construction issue, or fact finding, challenged in Cognex's opening brief?

1.b. Did the ITC properly find no infringement of the '539 patent, based on failure to return a location of "each local maxima with magnitude that exceeds the accept threshold," which is also not dependent on any claim construction issue, or fact finding, challenged in Cognex's opening brief?

1.c. Did the ITC properly find no infringement based on the construction of "probe...at which at least one test is performed" in the '539 patent such that for each probe, a test must be performed, which is consistent with the plain meaning of the term and is used as an express definition in the prosecution history in arguing patentability?

1.d. Did the ITC properly find no infringement based on the construction of "test" in the '539 patent to mean "a comparison of probe and image attributes based on a rating factor function," given that the only test in the specification uses a rating factor function and that it is described as the match function "used by the invention"?

1.e. Did the ITC properly find no infringement based on the constructions of “each” in the phrase “computing a match score at each pose,” and “to provide a match score surface” in the ’539 patent to mean “computing the match score for the entire set of poses in the image for which any instance of the pattern may be found to provide a set of match scores for all combinations of selected degrees of freedom,” given that the specification requires all poses in the search range to be included and it is required to identify the multi-dimensional location, as claimed?

1.f. Did the ITC properly find no infringement based on the construction of “locating local maxima in the match score surface” as preceding the step of “comparing the magnitude of each local maxima with an accept threshold” in the ’539 patent, given that this is the plain meaning and the only logical construction?

2. Did Cognex fail to prove that the HALCON software, when used, executes code that meets each of the claimed steps?

3. Did the ITC correctly conclude that Cognex waived any indirect infringement arguments because Cognex failed to offer any proof of intent?

4. Did the ITC correctly conclude that the ’539 and ’262 patents, which recite only algorithms that manipulate data and claim no tie to the real world, were invalid under 35 U.S.C. § 101?

STATEMENT OF THE CASE

On May 28, 2009, Cognex filed a complaint with the ITC, accusing MVTec Software GmbH, MVTec, LLC, and a number of MVTec customers of violating Section 337 of the Trade Act, 19 U.S.C. § 1337 by infringing the '112, '262, and '539 Patents. Cognex amended the complaint on June 26, 2009. (A314-60; A361-416.) The Respondents (hereinafter, collectively "MVTec") denied infringement and raised defenses of, *inter alia*, patent invalidity. (See, e.g., A6378-6418.)

Cognex dropped the '112 patent from the investigation on March 23, 2010. (A6425-30; A555-57.)

The ITC Judge held a technology tutorial on April 26, 2010. The ITC then held a full trial on all issues, from May 3-12, 2010, where the Court received extensive evidence about the technology, the patents, the prior art, and HALCON, among the testimony of a named inventor, a HALCON programmer, and three experts each with a PhD and each of whom has served as a Professor.

On July 16, 2010, the Administrative Law Judge ("ALJ") issued an Initial Determination ("ID"), 2010 WL 4778782 (U.S.I.T.C. July 16, 2010) (A15-116), finding that the '262 and '539 patents are invalid under 35 U.S.C. § 101, that neither patent was infringed for each of a variety of reasons, and that the '262 patent is invalid in view of the prior art. (A54-66; A81-89; A102-08.)

On September 24, 2010, the ITC determined to review portions of the ID. (A11-14.) On November 16, 2010, the ITC issued a Notice of Commission Decision to Modify a Final Initial Determination and to Terminate the Investigation with a Finding of No Violation of Section 337, and a Commission Opinion. (A1-4; A5-9.)

The ITC affirmed the findings under review, except for the conclusion that certain claims of the '262 patent were invalid as anticipated (not at issue on appeal here). (A3.) The ITC also affirmed that both patents are invalid § 101. (A5-9.)

Cognex appealed the ITC's determination of no violation of Section 337.

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STATEMENT OF FACTS

Cognex's brief is replete with incorrect factual statements or improper cites to the record. For example, Cognex asserts that

(App. Br. at 21.) Cognex cites to only one document –

(A2996-98.) MVTec does not have the space to identify each error, nor is it necessary since, like the above, none of these factual cheap-shots were adopted by the fact-finder and most are immaterial to any issue on appeal.

I. THE '539 PATENT

The '539 patent describes a system for finding the “pose” or location in an image of an object, based on a “model” for the object’s appearance. The “pose” is not simply the X and Y position in an image, because the object may (for example) be rotated to the left or right at any particular X and Y position. Thus, pose in the '539 patent identifies up to six degrees of freedom. The “translational” degrees of freedom are the X and Y coordinates. The “non-translational” degrees of freedom are orientation, size, aspect ratio and shear. (A244 (4:54-57).).

The '539 patent defines a search space of the possible locations or “poses” (a “pose” necessarily including every degree of freedom (A247 (9:40-43); A247-48 (10:66-11:1))) and ranks each possible pose with a “match score.” (A244-45 (4:64

– 5:4); A3921 (757:15 – 758:12).) The set of poses for each possible position is a “match score surface.” (A3925-26 (761:18 – 762:14).)

The '539 patent then finds each of the peaks (“local maxima”) in the match score surface. Each peak/local maxima has the highest match score within its general area in the image, and *may* therefore be the location of the object in the image. (A3926 (762:8-14).) To determine if it is, the '539 patent uses an “accept threshold”—every “local maxima” that exceeds the accept threshold is returned as a location where the object is found in the image. (A3926-27 (762:16-763:5).)

The '539 patent includes a particular way of generating the “match score.” “According to the invention, a model includes a set of data elements called probes,” where “[e]ach probe represents a relative position at which certain measurements and tests are to be made in an image at a given pose, each such test contributing evidence that the pattern exists at said pose.” (A245 (5:5-9); A207 (Abstract).) Thus, a “probe” is a relative position in a given pose where a particular measurement is made, tested, and added to what will become the final “match score” for that position/pose.

As explained more fully below, and as the ITC found, each probe must provide its contribution (*see* Section III(B), *infra*) and the test is the application of a “rating factor function” to a measured difference between the model and the image at each probe (*see* Section III(D), *infra*). (A39-45.)

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Also as explained more fully below (*see* Section III(C), *infra*) and as the ITC found, claim 1 requires that, at a given pose, *each* of the model's probes is used to contribute to the score. (A45-47.) In addition to corresponding to the plain language of the claim, Cognex argued this requirement in detail in a related application employing the same claim language, and Cognex's expert agreed. (A3739 (575:22 – 577:12).)

II. MVTEC'S HALCON SOFTWARE AND THE INITIAL DETERMINATION

The operation of HALCON will be described below for those aspects relevant to the present appeal.

(A3935-36

(771:16 – 772:1); A3939-40 (775:1 – 776:19).)

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(A6188; A3939-44 (775:10 – 780:17); A3956 (792:4-19); A3957-58 (793:20 – 794:24)

.)

The system is simply a different approach than that claimed. (A59.)

(A60.)

(A3753 (589:11-24; A3756:5-13).)

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(A56-57; A3937 (773:6-16); A3945-47

(781:9 – 783:3).) As discussed below,

, as confirmed by its prosecution history.

(A6190; A3959-60 (795:24 – 796:20).)

(A3960-62 (796:14 – 798:8); A4117 (953:2-10).)

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As the ITC found,

(A63-64; A4112-14

(948:21 – 950:1))

(A64; A3961 (797:9-16); A4117 (953:2-10).)

SUMMARY OF ARGUMENT

It is surprising that this matter is even before the Court. Cognex cannot prevail because it has conceded sufficient arguments that there can be no violation of Section 337. For the '262 patent, Cognex concedes the finding of no violation. (App. Br. at 3 n.1.)

For the '539 patent, Cognex does not contest two grounds for finding no infringement. First, Cognex does not appeal the (agreed) construction of the term "accept threshold" or the ITC's factual determination that HALCON does not have one. Second, Cognex does not appeal the ITC's factual finding that HALCON does not return the location of "*each* local maxima with a magnitude that exceeds the accept threshold," choosing instead to ignore it entirely. Since a reply is too late to raise new argument, it appears this appeal is pointless. (*See generally Section II, infra.*)

For the remaining unmet limitations in the '539 patent, the ITC followed the analysis mandated by this Court. While Cognex claims that some (but not all) of the ITC's constructions do not cover one disclosed embodiment, Cognex offered a great deal of expert testimony on how the embodiments in the patent work but offered *absolutely no testimony* to support an argument about preferred embodiments not being covered—surely Cognex cites none on appeal. (App. Br. at 52-53, 57, 60, 62-64.) And, Cognex did not make this argument to the

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Administrative Law Judge; the ITC was not obligated to consider this argument when it lacked record support and was not raised before the ALJ (and the argument is also wrong).

“At Which At Least One Test Is Performed”

The ITC correctly concluded that claim 1 requires that a test be performed at each probe of the model at a given pose (A40-41)

. (A55-57.)

The claim unmistakably provides that the model is composed of a “plurality of probes” (not a subset of probes within a model, as Cognex contends on appeal) and that each probe represents a position where at least one test is performed. If the model has 64 probes, then 64 “tests” are performed—an express confirmation of the claim’s plain language and an example that is included in the prosecution history (quoted below). (*See generally* Section III(B), *infra*.)

The “critical distinction” Cognex tries to draw on appeal (and for the first time) is between a “data element” and a “probe” – an amusing argument since Cognex’s proposed construction before the ITC was “a data element...” (A722; A37)) – does not exist in the patent, which states: “a model includes a set of data elements called probes.” (A245 (5:5-6).)

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“*Test*”

The method of the '539 patent “tests” fit at a probe by applying the difference between probe angle and gradient angle in the image to a “rating factor function,” to produce a value between 0 and 1. The ITC correctly determined that the claimed “tests” are based on these rating factor functions (A42-45), because the patent states that this is what is “used by the invention,” and there is no alternative described. (A56-57.) If correct, Cognex does not contend the limitation is met. (See generally Section III(C), *infra*.)

“Computing A Match Score At Each Pose”
and “To Provide A Match Score Surface”

The ITC correctly construed these terms to mean “computing the match score for the entire set of poses in the image for which any instance of the pattern may be found” and “to provide a set of match scores for all combinations of selected pose degrees of freedom.” (A45-48.)

But for the method to locate the *multi-dimensional* location (i.e., the location in all degrees of freedom) of *all* objects that might appear in the image, which is what is claimed, it **must** compare the model at each pose in the multi-dimensional search space. To do otherwise () is to do something other than what the claims require. Additionally, the claim recites one “surface” that includes all degrees of freedom and is the only one in which peaks are located to identify instances of

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objects in the image.

(A58-60.) (*See generally* Section III(D), *infra.*)

“Locating And Comparing”

The ITC correctly concluded that the step of locating local maxima must precede the step of comparing local maxima with an accept threshold (A60-62) (A60-62). Plainly, it would be *impossible* for the local maxima to be compared to a threshold before the local maxima are found. (*See generally* Section III(E), *infra.*) Once again, Cognex does not contend the limitation is met, given its proper construction.

Lack of Patent-Eligible Subject Matter

The claims in this appeal are not patent-eligible because they recite only algorithms that manipulate data without any tie to the real world. Cognex cannot cite any case in support of its argument that an algorithm is patent-eligible if it is sufficiently complex that it can only practically be run on a computer. That is not the law, it never has been, and it is inconsistent with *Benson*, in which the algorithm also had to be run on a computer.

Cognex instead attempts to rely almost entirely on the *RCT* case, as though it overruled and rendered moot Supreme Court precedent, including *Benson*, *Flook*,

and *Bilski*. For example, Cognex incorrectly argues that if a mathematical function or abstract idea has a real world application, it is patentable. This is not the holding of *RCT*, nor can it be. Euler's law, $E=mc^2$, and the process for calculating an alarm condition in a petrochemical or refining plant (*Flook*) all have practical real world applications, but they are not patentable unless the claimed invention sufficiently puts them in the real world—*Flook* did not, while the rubber curing process of *Diehr* did.

Here, the claims (like *Benson* and *Flook*) do nothing but perform a calculation. The claims are just mathematical algorithms. (See generally Section VI, *infra*.)

Failure to Prove Infringement

Cognex failed to prove that the HALCON software, when used, executes code that meets each of the claimed steps. It is not enough to show that the software was used in the United States.

Cognex Waived Indirect Infringement Arguments

The ITC correctly concluded that Cognex waived any indirect infringement arguments because Cognex failed to offer any proof of intent.

The '539 Patent Is Invalid Under Cognex's Constructions

Finally, if the Court were to determine that the ITC incorrectly construed all the terms, then the '539 patent is invalid based on prior art.

ARGUMENT

I. STANDARD OF REVIEW

This Court reviews the factual findings of the ITC for “substantial evidence.” *See* 5 U.S.C. § 706(2)(E); *Personalized Media Commc’ns, LLC v. ITC*, 161 F.3d 696, 702 (Fed. Cir. 1998). This Court should not disturb factual findings supported by “such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.” *Surface Tech., Inc. v. ITC*, 801 F.2d 1336, 1340-41 (Fed. Cir. 1986). Legal determinations are reviewed *de novo*. *See* 5 U.S.C. § 706(2)(A); *YBM Magnex, Inc. v. ITC*, 145 F.3d 1317, 1320 (Fed. Cir. 1998).

II. COGNEX HAS CONCEDED NON-INFRINGEMENT

For the ’262 patent, Cognex has conceded that the ITC’s finding of no infringement is correct. (App. Br. at 3 n.1.) This alone is, obviously, sufficient to confirm the conclusion of no violation, notwithstanding the parties’ other arguments.

The same is true for the ’539 patent. While Cognex purports to challenge the ITC’s conclusion of no infringement, Cognex fails to do so on each of the grounds supporting that conclusion. Cognex cannot properly be permitted to argue these limitations for the first time in a reply brief. *Smithkline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1319 (Fed. Cir. 2006). The conclusion of no violation of the ’539 patent should be affirmed.

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A. The Construction of “Accept Threshold” in the ’539 Patent Was Not Disputed And Is Dispositive

The term “accept threshold” was construed *by agreement* to mean “a value that a match must exceed to be considered an instance of a pattern.” (A49.) The ITC found that HALCON does not meet this claim limitation because

as that term was construed by the parties’ agreement. (A62-64 (quoting A4112-14 (948-50)).) *Cognex also does not appeal these factual findings.*

Cognex’s failure to raise these issues on appeal is dispositive—a reply brief is too late. *See id.*

B. Cognex Does Not Meaningfully Challenge the ITC Conclusion That HALCON Does Not Return “Each Local Maxima” That Exceeds An Accept Threshold, in the ’539 Patent

The ITC’s finding on this limitation was well founded (and is unchallenged) for two reasons.

First,

(*See Statement of Facts, supra.*)

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(A4116-17 (952:15 – 953:10); A4117-18 (953:14 – 954:5); A3960-61 (796:21 – 798:8.)

(A64.) *See, e.g., ResQNet.com, Inc. v. Lansa, Inc.*, 346 F.3d 1374, 1379 (Fed. Cir. 2003) (finding that “each” means “each (and every)”).

Second,

(A3955-56 (791:4 – 792:3); A4118 (954:11-18).)

(A64-65.)

These ITC findings *are not dependent on any disputed claim construction*, and surely no such dispute can be found in Cognex’s appeal brief.

The factual finding of no infringement based on this construction also is not genuinely contested on appeal. The closest Cognex comes to argument is to (wrongly) state that

(App. Br. at 74.)

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The only support for Cognex's assertion on appeal requires some sleuthing, appearing to be at page 32 n.8, where Cognex criticizes the ITC for failing to understand complex technology and then, by way of example, misquotes expert testimony that

The (unexplained) portions of the record Cognex cites do not help Cognex in this regard at all. Below (but not on appeal), Cognex argued that

(*See, e.g.*, A49; A732.)

The ITC correctly determined that the *final* result is what is returned. (A50 ("it is the final result of the location/pose that is returned").) On appeal, it would appear that Cognex agrees. The one paragraph it devotes to this limitation refers to the return of the *final* result.

Thus, on appeal, Cognex leaves entirely unaddressed the ITC's conclusion that

III. FOR THE '539 PATENT THE ITC ALSO CORRECTLY FOUND NO VIOLATION BASED ON THE LIMITATIONS COGNEX DOES ARGUE

Cognex does not argue that HALCON infringes, if any of the claim constructions adopted by the ITC is proper; if any of the proposed constructions

are affirmed, the no violation conclusion should be as well. (*See, e.g.*, App. Br. at 5-6 (failing to raise any question about whether the ITC erred in finding infringement under its claim constructions).)

A. The ITC’s Approach to Claim Construction Was Correct

As a general matter, Cognex attempts to fault the ITC’s approach to claim construction, but the ITC began exactly where it should have, by reading the claims in light of the specification. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (“[u]sually, [the specification] is dispositive; it is the single best guide to the meaning of a disputed term”).

There is a line between properly interpreting claims in the light of the specification, as mandated by *Philips*, and improper narrowing. This line is identified by analyzing the several factors considered by the ITC, including whether the specification provides an express definition, whether the specification describes a particular feature as critical to the invention, whether the construction at issue is true for just some embodiments or for all embodiments, and whether the patent teaches a particular aspect of the invention as an improvement over the prior art. *See, e.g., Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1324 (Fed. Cir. 2008) (construing “flow restrictor” to mean “a structure that serves to restrict the rate of flow sufficiently to prevent a hazardous situation” due to “the specification’s consistent emphasis on this fundamental feature of the invention”); *Ormco Corp. v.*

Align Tech., Inc., 498 F.3d 1307, 1313-14 (Fed. Cir. 2007); *SafetCare Mfg., Inc. v. Tele-Made, Inc.*, 497 F.3d 1262, 1270 (Fed. Cir. 2007); *Andersen v. Fiber*, 474 F.3d 1361, 1367-68 (Fed. Cir. 2007); *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1370 (Fed. Cir. 2003).

The ITC did not limit the claims to “preferred embodiments.” Instead, it relied on statements in the specification that (a) clearly define claim terms, (b) refer to every embodiment, and/or (c) describe “the invention.” That is precisely what this Court has instructed lower courts to do. *See Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545, 1551 (Fed. Cir. 1996) (“[W]hen the preferred embodiment is described in the specification as the invention itself, the claims are not necessarily entitled to a scope broader than that embodiment.”); *General American Transportation Corp. v. Cryo-Trans, Inc.*, 93 F.3d 766, 770 (Fed. Cir. 1996) (“This is not just the preferred embodiment of the invention; it is the only one described.”).

Every time Cognex argues that the ITC’s construction “does not cover the preferred embodiment,” what Cognex identifies is not an embodiment of anything, or is something that is not claimed in the ’539 patent. The specification of the ’539 patent has spawned at least fourteen other patent applications (A3248 (84:23-25)), and it certainly is not the case that every claim in every patent covers everything in

the specification. *See, e.g., Ventana Med. Sys., Inc. v. Biogenex Labs., Inc.*, 473 F.3d 1173, 1181 (Fed. Cir. 2007).

Notably, Cognex’s “doesn’t cover the embodiments” arguments were not supported by any witness for Cognex at the hearing, and, in fact, they were almost all presented for the first time in Cognex’s Petition for Review of the Initial Determination (“Petition”). Given the technical complexity of what is described in the patent, as well as the fulsome nature of the testimony Cognex *did* offer at the hearing on claim construction, the failure is telling. What is more, the ITC is not obligated to consider arguments raised for the first time by petition. *Broadcom Corp. v. ITC*, 542 F.3d 894, 901 (Fed. Cir. 2008) (argument waived by failing to adequately present it to administrative law judge); *Hazani v. ITC*, 126 F.3d 1473, 1476-77 (Fed. Cir. 1997) (same).

As an initial matter, Cognex attacks Dr. Mundy’s testimony, part of which was devoted to explaining to the ALJ the complex methods described and claimed in the patents, as somehow improper. (Cognex’s expert, of course, did the exact same thing.) These complaints are unfounded. There is nothing wrong with using expert testimony to assist the trier of fact. *See* Fed. R. Evid. 702. It is perfectly appropriate to use expert testimony to explain how complicated systems, beyond the ability of a lay witness to interpret, work.

The lone case Cognex cites on this point, *Arlington Indus. v. Bridgeport Fittings, Inc.*, 532 F.3d 1246 (Fed. Cir. 2011), certainly does not stand for the proposition that “expert testimony as to how the disclosed embodiment works is not a proper consideration for claim interpretation.” (App. Br. at 48.) The court in that case did not reject the proposed construction of “spring metal adaptor” because it was based on any improper expert testimony; rather, it found that the expert’s analysis was incorrect. *Id.* at 1255.

B. The ITC Correctly Construed “At Which At Least One Test Is Performed” And Thus Correctly Found No Infringement

The plain language of claim 1 of the ’539 patent is explicit that a “test” must be performed at each probe of the model at a given pose. The claim states that, for “each probe,” “at least one test is performed in an image at a given pose”:

providing a model that represents the pattern to be found, the model including a plurality of probes, each probe representing a relative position at which at least one test is performed in an image at a given pose, each such test contributing evidence that the pattern exists at the pose;

(A262, Claim 1.) This notion is reiterated throughout the patent. (See, e.g., A207 (Abstract); A245 (5:6-9); A246 (7:9-11).)

As the ITC recognized, the plain language requires that the model be composed of a “plurality of probes,” and that each probe in the model represents a position where at least one test is performed at a given pose. (A39-41.) As an example, if the model has 64 probes (when it is created), then 64 “tests” are

performed at each pose when it is compared to the image. This is not so much a matter of complex claim construction as it is simply reading English.

Were there doubt on the plain language (there should not be), the prosecution history makes the meaning manifest. This claim language was argued in a continuation of the '539 patent, U.S. Serial No. 11/028,353, currently pending. In that application, Cognex argued—in connection with *the exact same Fig. 7 that shows the probes in the '539 patent*—that the very same limitation language “at which at least one test is performed” requires that the tests are performed at every probe at a given pose:

To this end, see Fig. 7 of the present specification that shows a cross and circle pattern on which 64 separate probes have been superimposed. In the case of the Fig. 7 pattern, the inventive method calls for at least one test to be performed at each of the 64 separate model probes (e.g., 710, 730, etc., - i.e., one test for each probe included in the model) illustrated for a model pose (i.e., a specific location/orientation/size of a pattern in a multidimensional image or space (see col. 4, lines 46-47)).

Thus, according to the present invention, tests are performed at each of the model positions for a pose (i.e., if there are 64 probes, 64 separate tests are performed) regardless of whether or not there is any initial evidence (e.g., detection of an edge) that a pattern exists at the specific pose.

(A5405-06.) The language “i.e., if there are 64 probes, 64 separate tests are performed” makes plain that ***all*** probes must be evaluated. (See A4101-05 (937:8 – 941:9); A3741 (577:8-12).)

Having argued that ***identical*** language in a continuation application requires that a test be performed at every probe (consistent with the plain meaning of the

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claim language), Cognex is now bound by that construction. *See, e.g., Ormco*, 498 F.3d at 1314.

Cognex does not even address this key prosecution history. But it is no secret – it was argued before the ITC. (A41.) Once again, Cognex’s failure to address critical arguments, which would deprive MVTec of an opportunity to respond were it permitted, appear dispositive.

Cognex now wants to rewrite this claim language, although it is not entirely clear how.

The “critical distinction” Cognex tries to draw on appeal (and for the first time and thus waived) between a “data element” and a “probe” – an amusing argument, since Cognex’s proposed construction before the ITC was “a data element...” (A722; A37)) – does not exist in the patent, which states: “a model includes a set of data elements called probes.” (A245 (5:5-6).) If Cognex complains that the ITC required a probe at *every* data element, the argument is utterly unfounded in the findings of the ITC, which required only that the probes (a limited set of data elements) be evaluated every time.

Cognex goes on to argue that a “probe” is not one of the predetermined model elements (“the model includes a plurality of probes”) but rather is only a “probe” if it happens to be used at a particular position. This argument would

mean that the model has a constantly changing number of “probes” as it moves across the image. There is *absolutely nothing* in the claims or in the specification of the ’539 patent to support the idea that the model that “includes a plurality of probes” may take on a different set of probes every time the model is used. As the ITC recognized, this is not what the claim says, and there is no support for anything like this in the patent (much less in the prosecution history, which, as described above, is precisely to the contrary). (A39-41.)

What is more, this argument would destroy the entire premise of probes. The patent makes plain that the model is composed of probes that are established *when the model is created*, and that the model set of probes is sufficient to find the object, as shown, for example, in Figs. 7 and 8. (A216-17 (Figs. 7-8).) If a test is not performed at a probe, that does not convert a probe into something that is not a probe; it simply means that no test was performed *at that probe*, taking it outside of the claim language, as explained in the prosecution history.

Cognex’s argument also relies on the faulty premise that the ITC stated that probes are a “subset of data elements.” In *reality*, the ITC clearly held that “Cognex’s argument that ‘[i]f the test or measurement does not occur at that place, the thing is not a probe because it has not probed, tested or measured at the location’ is … rejected.” (A40.)

It also is not true, as Cognex argues, that the ITC's holding is "contrary to the teaching in the specification" and to dependent claims 14 and 15. (App. Br. at 51-52.) This is yet another argument that should be disregarded because Cognex did not make it before the ALJ, offered no supporting testimony about what is described in the specification in this regard (testimony that would never have survived cross-examination), and made it for the first time in the Petition to the ITC. The ITC was not obliged to consider the argument, and it is waived.

Broadcom, 542 F.3d at 901; *Hazani*, 126 F.3d at 1476-77.

The argument also does not withstand scrutiny. The excerpt cited by Cognex merely states that the model can be built with more or fewer than a number that is "predetermined" (e.g., 64) before the model is built. In each case, when the model is built, a set of probes are identified and those probes must be sufficient to identify the object in the image. There is nothing in the specification or elsewhere that suggests that the number of probes in the model shifts from moment to moment after it is built.

Similarly, Claim 14 merely recites that the model can be built with a predetermined number of probes (e.g., 64, as in claim 16), while claim 15 simply states that the model can instead be built with more or fewer than the predetermined number, in order to maintain a certain probe spacing in a particular model.

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The claims have nothing to do with having a model with varying numbers of “probes” after it is built. To the contrary, these claims also describe the use of a fixed number of probes once it is built. It may be built using a predetermined number like 64, or it may be built using a different number to maintain spacing for models for particular objects, e.g., a large object might need model with a larger (fixed) number of probes and a small object might need fewer probes. Once built, however, it has a fixed number.

Once again, Cognex either could not get its own expert to agree with this argument, as he did not testify about it, or perhaps the argument does sufficient violence to the plain language of the claims, in light of the specification, that it had not occurred to the patentee to make it. Indeed, Cognex’s own expert confirmed the ITC’s reading of the claim language, in light of the patent and its prosecution history. (A3741 (577:8-12).)

Cognex’s argument (App. Br. at 72) (another one that was minted after the hearing and need not be entertained on petition to the ITC or appeal before this Court) depends on its rejected construction of “each pose” (*see* Section III(D), *infra*) and does not compel a different result. This is because the claim requires that “*each probe* represent[s] a relative position at which *at least one test is performed* in an image *at a given pose*.” (A262, Claim 1.) In other words, *for any particular pose*, each probe is tested. To hold

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otherwise would render meaningless the claims language and destroy meaning for the prosecution history quoted above.

(A3740-41 (576:6 – 577:12).)

Perhaps recognizing that the argument was both late and wrong, Cognex offers another late-found theory, arguing that

(App. Br. at 70-71.)

Unlike the others, this argument actually was raised at the hearing, although it was then immediately withdrawn by Cognex because it was raised too late. The argument was not in any expert report or pre-hearing contention and, therefore, ***was objected to and withdrawn.*** (A3538-45 (374:16–381:15).) Cognex does not (and cannot) claim the ITC erred in allowing *Cognex* to withdraw this argument and, therefore, the argument should not be permitted now.

This procedural history is telling for Cognex's other arguments as well. Had they been raised before the ALJ, they would have been objected to and, presumably, withdrawn or the objection sustained.

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In any event, like the other arguments, even were this last argument properly be made, it also fails because

The claim provides that the “model includ[es] a plurality of probes” and the model is used to generate the match scores and to identify objects in the image. Here, Cognex essentially argues that the “model” used to identify objects is really only a subset of itself, insufficient to perform its role in the claim; such an argument is untenable on its face, again would destroy the plain meaning of the claim language, and is utterly inconsistent with the prosecution history quoted above.

C. The ITC Correctly Construed “Test” And Thus Correctly Found No Infringement Because

The ITC correctly interpreted test as requiring a “rating factor,” because the ’539 patent describes and criticizes the prior art for examining match, and then characterized tests based on rating factors as “the invention.”

The ’539 patent describes a system where “measurements and tests” are performed at each probe. (A245 (5:5-9).) The “measurement” described in the ’539 patent is a measurement of the difference between the probe angle and the corresponding gradient angle in the image. (A4031- (867:14-870:13).)

The method then takes that measurement and applies it to a “rating factor function,” to produce a value between 0 and 1 that represents the evidence contributed by that probe. (A4031-34 (867:14 – 870:13).) For example, if the

angular difference between the model and the image is 5 degrees, the rating factor function may return a value of 1 (reflecting a good match), but if the angular difference is 30 degrees, the rating factor function may return a value of 0 (reflecting a poor match).

Thus, the “measurement” in the ’539 patent is the determination of the angular difference between the directions of the probe and the image gradient; the “test” is the application of the rating factor function to that angular measurement.

The ’539 patent is very specific regarding the use of this particular test, i.e., rating factor functions, to overcome prior art deficiencies. It begins by characterizing the problems in the prior art:

Furthermore, edge detection fundamentally requires a binarization step, where pixels are classified as “edge” or “not edge,” usually by a combination of thresholding and peak detection. Binarization, no matter what method is used, is always subject to uncertainty and misclassification, and will contribute failure modes to any method that requires it.

(A244 (3:52-58); A4029-30 (865:4-866:13).)

Contrasting the prior art binarization, the ’539 specification devotes three full columns to describing “the match functions *used by the invention*,” all of which use a measurement of angular difference followed by application of a “rating factor function” as the test, to overcome the “failure modes” of binarization. (A254-55 (cols. 23-26) (emphasis added); A4029-30 (865:4 – 866:13).)

Significantly, there is no “test” in the ’539 patent that is not a rating factor function (A4027-28 (863:21 – 864:8)), and Cognex does not argue otherwise.

Under these circumstances, the ITC’s construction of “test” was correct.

*See, e.g., Retractable Techs., Inc. v. Becton, Dickinson and Co., 2011 WL 2652448, at *7-8 (Fed. Cir. July 8, 2011)* (holding that where the specification described “the invention” as including a one-piece body, criticized prior art syringes that had a two-piece body, and did not disclose an embodiment with more than a one-piece body, the term “body” did not include bodies composed of multiple pieces).

Cognex’s very general construction of “test”—“a comparison of probe and image attributes”—must be incorrect because it includes **both** what the patent calls a “measurement” and what the patent calls a “test,” even though the patent uses those terms distinctly. (*See, e.g.*, A262, claim 8 (“measurement and test”); (A245 (5:5-9).) *See Phillips*, 415 F.3d at 1314-15. The patent plainly uses the term “test” to mean the thing to which the measurement is applied, and that each of the tests “used by the invention” is a rating factor function. Additionally, Cognex’s construction also must be incorrect because it would cover the binarization that the specification disparages and distinguishes “the invention” from.

Cognex simply ignores any analysis of the above-cited portion of the specification, other than to argue that Figure 13 “describes a ‘match function’ not a ‘test.’” (App. Br. at 54.)

But this is the “test,” even if the specification never uses the word “test.”

Dr. Mundy testified without contradiction that the specification was “very clear” that the “test” is a comparison between the probe and image attributes based on a rating factor function. (A4183 (1019:13-17).) While criticizing, Cognex never points to anything else in the specification that is a “test,” meaning that if the test is not a comparison based on rating factor function, then it is not described in the patent at all.

Cognex also italicizes and underlines the word “example” that appears on line 49 of column 23, apparently in an effort to argue that the match functions in Fig. 13 are only “examples,” and that other match functions may be used. This is another instance in which Cognex is misrepresenting the specification (and, again, it is no wonder Cognex did not ask its expert to explain it; presumably he would not ascribe to this nonsense). The discussion of Fig. 13 is clear *when read in its entirety*:

FIG. 13 gives details for the match functions used by the invention. FIGS. 13a and 13b show examples of direction rating factor functions. A direction rating factor is value 50 between 0 and 1 that indicates degree of match between a probe’s expected gradient direction 1140 and the actual gradient direction found in a gradient direction image 244 under the probe. A direction rating factor function produces a direction rating factor as a function of direction error, 55 defined as an angle measured from the expected gradient direction to the actual gradient direction. Any of a variety of direction rating factor functions could in principal be used to practice the invention.

(A254, (23:48-59));

25 FIG. 13c shows an example of a magnitude rating factor
 function. A magnitude rating factor is a value between 0 and
 1 that indicates a degree of confidence that a particular pixel
 position lies along a boundary and therefore that a probe test
 made at said position would result in reliable evidence for,
 in the case of positive weight probes, or against, in the case
 30 of negative weight probes, the existence of an instance of the
 trained pattern 105 at the pose under test. A magnitude rating
 factor function produces a magnitude rating factor as a
 function of gradient magnitude. Any of a variety of magni-
 tude rating factor functions could in principal be used to
 35 practice the invention.

(A254 (24:24-35)).

This shows that Fig. 13 (which consists of Figs. 13A, 13B, and 13C) illustrates the match functions “used by the invention.” Figs 13A and 13B show “examples” of *direction rating factor functions*. Fig. 13C shows an “example” of a *magnitude rating factor function*. But every one of the match functions in Fig. 13 uses either a “direction rating factor function” or a “magnitude rating factor function.” Thus, as Dr. Mundy explained, every test in the patent uses a rating factor function. (A4028 (864:6-8).) There has never been any contention from Cognex to the contrary and Dr. Horn did not address this.

Cognex’s argument that “a match function is not a test” is backwards; the question is what is a “test,” not what is a match function. (App. Br. at 54.) For this reason, the fact that Dr. Mundy and Dr. Forsyth agreed that a match function is not a test is *completely irrelevant*. Moreover, even if Cognex’s argument was flipped around, it would still be irrelevant, because *the ITC did not conclude that a match function is a test*. Instead, the ITC correctly concludes that the “test” in the

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'539 patent is "*a comparison of probe and image attributes based on a rating factor function.*" The test is a comparison, and the comparison in the '539 patent is *always* based on a rating factor function.

Finally, Cognex asserts that Dr. Mundy "could not point to a single reference in the '539 patent that says the tests must be based on a rating factor function." (App. Br. at 54.) Dr. Mundy did, however, testify that it was "very clear" that the patent says a "test is a comparison between a probe and image attributes based on a rating factor." (A4183 (1019:13 – 1020:8).) If another express definition is not cited, it is only because *the specification does not use the word "test" at all.*

Surely Cognex does not identify any other description of "test." If a comparison based on a rating factor function is not the claimed "test," then the patent does not describe any test at all, and the claims fail the written description and enablement requirements because not one example is provided. Or, when the specification is read as a whole, a person of skill in the art (such as Dr. Mundy – Cognex's expert was silent on the subject) would understand that the measurement is angular difference and the "test" is application of a rating factor function.

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(A56; A4087-88 (923:25 – 924:10).)

(App. Br. at 71.)

(App. Br. at 71 n.13)

D. The ITC Correctly Construed “Computing A Match Score At Each Pose” And “To Provide A Match Score Surface”

The ITC construed the language “computing a match score at each pose” to mean “computing the match score for the entire set of poses in the image for which

any instance of the pattern may be found.” (A45-47.) And, the ITC construed “to provide a match score surface” to mean “to provide a set of match scores for all combinations of selected degrees of freedom.” (A47-48.) Each construction was correct.

Cognex ascribes two errors to these constructions. First, it says that the ITC incorrectly construed the term “at each pose” to mean “the entire set of poses and image for which any instance of the pattern may be found.” (App. Br. at 55-58.) The short answer is that the plurality must be all of the poses in order for the claimed method to operate properly. The method of the ’539 patent determines multi-dimensional locations of “any” objects in an image by comparing the model to the image at a set of poses, creating a match score surface, locating local maxima in the match score surface, comparing the local maxima to a threshold, and then returning the maxima that exceed the threshold as instances of objects in the image. (A262, Claim 1.) In order to locate the *multi-dimensional* location (i.e., the location in all degrees of freedom) of *any* objects that might appear in the image, the method **must** compare the model at each pose in the multi-dimensional space (i.e., in all degrees of freedom). (A4042-43 (878:13 – 879:10).)

The specification makes plain that “all” poses in the search range are included:

The set of poses to be evaluated during the coarse scan step is the result of generating ***all combinations of selected values for each degree of freedom.***

(A247 (9:40-43)); and

The invention uses a set of nested loops during the coarse scan step to generate *all combinations of parameter values of the generalized-DOFs in use.*”

(A247-48 (10:66 – 11:1)).

Cognex’s argument is that because the claim reads “comparing the model with the run-time image at each of a *plurality* of poses” and then “computing a match score at each pose to provide a match score surface,” it should be construed to mean that the match score need not be computed at all poses, because, the argument goes, the score need only be computed for a “plurality of poses.” This is plainly untrue. The “comparing” is at a plurality of poses and a score is computed for each of the plurality. And, as explained above, the plurality of poses *must* be the entire set of poses of which there are at least two (i.e., all poses, in all degrees of freedom) for the claimed method (and every embodiment described in the specification) to work.

Cognex attempts to support its argument that the “plurality” can be a subset of the possible poses with yet another distortion of the specification that finds no support in any testimony of their expert. (App. Br. at 57.) Contrary to Cognex’s *counsel’s* interpretation of Fig. 23 of the ’539 patent, it is not an example of evaluating less than all the possible model poses. This is because the “poses” in that figure are the squares that have the dots, and *the squares that do not have dots*

are not poses in the search space: “[i]n each example, the dots indicate relative positions to be evaluated.” (A259 (34:40-41).) Thus, this example will not find a “location” other than where the dots appear.

The patent explains that the model may be evaluated at every position, in which case the “plurality” is every position (including the positions with no dots in Fig. 23), or it may be evaluated at a subset of positions (the positions with dots), in which case the “plurality” is the subset. There is ***no*** embodiment, however, in which the model is not tested at each of the possible positions in whichever set of positions is determined to be the search space.

Once again, the most obvious problem with Cognex’s interpretation is that it results in a claim that cannot achieve what is described in the claim. In order to locate the *multi-dimensional* location (i.e., the location in all degrees of freedom) or the *presence or absence* of an instance of a pattern, the method ***must*** compare the model at each pose in the *multi-dimensional* space (i.e., all poses in all degrees of freedom). (A4042-43 (878:13 – 879:10).) The whole point of the method is to locate objects in images. In order to do that, one must compare the model at each pose; otherwise, possible matches may be missed. (A3752-53 (588:14 – 589:10).) There is no description anywhere in the specification of a method that only compares the model at, for example, two poses. It doesn’t make any sense.

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One can only assume that Dr. Horn was not asked to offer this analysis because he would have had to acknowledge that it is plainly incorrect. In any event, there is *absolutely no evidence* that what is in Fig. 23 is a “preferred embodiment” that is not covered by the ITC’s claim construction.

Cognex attacks MVTec’s assertion that the claimed method would not work if it did not test all poses by asserting that (App. Br. at 58.)

(A4105-09 (941:10 – 945:2); A3685-86 (521:20 – 522:10).)

Cognex also argues that whether an invention will work is irrelevant to claim construction, but this is incorrect. A person of skill in the art would not read a claim in a manner that it does not achieve what is described in the preamble. *See Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1344-1347 (Fed. Cir. 2003). The lone case cited by Cognex on this point, *Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870 (Fed. Cir. 1993), does not support its argument. In *Miles Labs*, the court simply concluded that an argument about whether the claim was operable was an enablement argument, not an indefiniteness argument, and actually construed the claims in a manner in which they were

operable, contrary to the defendant's (and Cognex's) argument. *Id.* at 875.

The second error, according to Cognex, is construing "match score surface" to mean "a set of all match scores for all combinations of selected degrees of freedom." (App. Br. at 58-60.) For the reasons just stated, however, for the claimed method to work, the match score surface must include all of the degrees of freedom under consideration. Here, Cognex's argument is based on a portion of the specification that was never addressed at the hearing, or in the post-hearing briefing. And, once again, Cognex must badly mischaracterize the patent to make its argument.

Cognex argues (again without any support in the record) that the following portion of the specification shows that the ITC's construction of "match score surface" covers only a "preferred embodiment" (App. Br. at 59-60):

In any specific embodiment of the invention the search space is defined by certain degrees of freedom that include the two translation degrees of freedom and some number, possibly zero, of non-translation degrees of freedom such as 35 orientation and size. Many methods can be devised within the scope of the invention to generate the set of poses to be evaluated for purposes of pattern location. In a preferred embodiment, any specific pose is the result of specifying values for each degree of freedom. The set of poses to be 40 evaluated during the coarse scan step is the result of generating all combinations of selected values for each degree of freedom. For this preferred embodiment, two distinct methods are used in combination to generate the set of poses, one for translation and one for non-translation 45 degrees of freedom.

(A247 (9:32-46).)

This passage is not directed to whether all dimensions of the search space need to be represented in the match score surface. The beginning simply indicates that (as described above), there are different ways to *select the set of poses* that are going to be evaluated. This does not speak to the match score surface at all. The paragraph as a whole simply explains there are a variety of ways to select the set of poses that are going to be evaluated, including, for example, enumerating the degrees of freedom individually (“any specific pose is the result of specifying values for each degree of freedom”) (A247 (9:38-40)) instead of as a 2×2 or 2×3 matrix as a whole, but that (as the portion on which the ITC relied states) the set of poses that *are* evaluated (i.e., those that will form the match score surface) will include “all combinations of selected values for each degree of freedom” (A247 (9:40-43)). The “preferred embodiment” that is mentioned in this passage is one in which a pose “is the result of specifying values for each degree of freedom”—this has nothing to do with the nature of the match score surface.

Likewise, Cognex’s argument that the last sentence of the cited paragraph (A247 (9:43-47)) implies that two match score surfaces are computed is wrong. This is another argument that should be disregarded because Cognex introduced it for the first time in a post-hearing *reply* brief. (A850.) In any event, this sentence in the specification is again about selecting the set of poses, and not about the match score surface. The sentence merely expresses that in operation, for non-

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translational degrees of freedom, it is more efficient that the model points are transformed once, whereas for translational degrees of freedom, the transformation can be computed on the fly with a mere addition, which is more efficient. This does not mean that two match score surfaces are computed.

Cognex also cites to Figures 21A and 22A in an effort to support this argument (App. Br. at 60, citing A258 (32:39-43) and A259 (33:60-65)), but, for the reasons just stated, this does not result in two match surfaces being computed. Additionally, these new citations are portions of the specification that are not covered by the claims of the '539 patent (although it may be covered by claims of one of the many other patent applications that share this specification). Figures 21A and 22A are only part of a larger algorithm depicting an optional “coarse scan” step that “produces a preliminary list of results 160 for further processing” (A258 (31:36-38)) and therefore does not determine the location, or the presence or absence, of anything.

Cognex thus fails to point to any embodiment that is excluded by the ITC’s construction. And because Cognex did not raise this argument until after the hearing, there is no expert testimony for either side on this issue.

This is another instance in which Cognex is seeking to distort the claim

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(A58-60.)

(A4105-06 (941:10

– 942:13).)

Cognex does not address this finding, conceding non-infringement under the ITC's claim construction. Without addressing the ITC's finding, however,

(App. Br. at 73.)

(A4043-44 (879:18 – 880:20); A4107-09 (943:12 – 945:2).) For the claim to work, the match score surface **must** include all of the degrees of freedom under consideration. (A4044 (880:12-20).)

(A60-64.)

(A4019 (945:3-17)),

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E. The ITC Correctly Construed “Locating” And “Comparing” And Thus Correctly Found No Infringement Of These Claim Elements

The ITC correctly concluded that “the step of ‘locating local maxima in the match score surface’ must precede the step of ‘comparing the magnitude of each local maxima with an accept threshold.’” (A62.)

In situations *like this one*, where the method steps have an implicit sequence, this Court imposes the claim drafter’s order. *See, e.g., Combined Systems v. Defense Tech. Corp.*, 350 F.3d 1207, 1212-13 (Fed. Cir. 2003); *Loral Fairchild Corporation v. Sony Corp.*, 181 F.3d 1313, 1321 (Fed. Cir. 1999); *Mantech Environmental Corp. v. Hudson Environmental Services, Inc.*, 152 F.3d 1368, 1375-76 (Fed. Cir. 1998).

Indeed, implicit ordering of method claim steps is frequently imposed in software cases, such as this one. *See, e.g., Ring Plus, Inc. v. Cingular Wireless Corp.*, 614 F.3d 1354, 1363-64 (Fed. Cir. 2010) (holding that the steps of a software algorithm for operation of a telephone system must be performed in order, reasoning that “[y]ou cannot initiate the playing of the message as required by step 1e), if it has been playing all along”); *STS Software Sys. Ltd. v. Witness Sys., Inc.*, 2006 U.S. Dist. LEXIS 98239, at *43 (N.D. Ga. Oct. 10, 2006) (requiring the steps of storing collected data in “identified data packets” and “organizing . . . the

identified data packets” to be performed in that order); *Spreadsheet Automation Corp. v. Microsoft Corp.*, 2006 U.S. Dist. LEXIS 98070, at *48-*49 (E.D. Tx. Nov. 9, 2006) (holding that the step of placing two sets of data into a computer’s memory must precede “merging” the data, which, in turn, must precede outputting the merged data); *Collegenet, Inc. v. Xap Corp.*, 2004 U.S. Dist. LEXIS 22370, at *116 (D. Or. Oct. 29 2004).

Most of these cases were already cited to the ITC, and Cognex fails to address any of them in its Brief.

Here, it is readily apparent that the step of “comparing the magnitude of each *local maxima* with an accept threshold” **must** be preceded by the step of “*locating local maxima* in the match score surface.” This is because it would be **impossible** for the local maxima to be compared to a threshold before the local maxima are found.

Cognex argues that if every point in a surface is compared to a threshold, then the steps are performed in reverse order because local maxima would be among the points compared, even though they were not yet actually located. (App. Br. at 63.) This is simply not the same as finding peaks in the surface and then comparing the peaks to a threshold, which is what the plain language of the claim requires. Because the “comparing” step refers explicitly to “each local maxima,” it logically requires that each of those local maxima have already been identified.

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Cognex's reading is not how anyone would interpret a request to find something and to do something to the thing that was found. For example, if a homeowner asked a tree-cutter to find the tallest trees in a yard and cut them down, the homeowner would undoubtedly be shocked if the tree-cutter cut down every tree in the yard and then measured them to see which were the tallest. Cognex's interpretation is not the plain meaning, and it is not even logical.

Finally, Cognex again refers to Fig. 22A to argue that it shows comparing local maxima before locating them. (App. Br. at 62.) Once again, however, there is no testimony about this figure because it was not identified by Cognex until after the hearing. Once again, this Figure is from an embodiment not covered by the claims of the '539 patent (or perhaps claims 33-35, if any), as it depicts an optional "coarse scan" step (and a "fine-scan" step). (*See* Section III(D), *supra*.) In any event, it does not show comparing before locating, as both steps are referenced in one box of a flow chart, and the specification merely says that the step "examines the scores and looks for local maxima above a noise threshold." (A259 (34:10-11).) This still does not explain how one can compare two values when one of the two is yet to be determined.

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(App. Br. at 73.)

(A4019 (945:3-17).)

(*See* A3782 (618:20-25).)

(A3782 (618:20-25); *see also* A3785 (621:25-624:6); A3796-98 (632:14-634:7).)

IV. COGNEX NEVER PROVED INFRINGEMENT OF THE '539 PATENT

Cognex argues that it proved infringement of the '539 patent because “[t]he undisputed evidence shows the software is used in the United States” and that

(App. Br. at 74.)

This argument misses the point. For the '539 patent, MVTec's argument on the failure of proof is that Cognex has not shown that the software itself includes computer code that, when operated, performs the claimed steps. It is not enough to

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show that HALCON

has been used; Cognex must show that, when used, the HALCON software executes code that meets each of the claimed steps.

Specific instances of failed proof regarding the '539 patent include the fact that during the summary portion of the testimony with respect to the "providing a model" claim element,

(A3518 (354:7-25), citing A6112)

and, during the review of the source code, this element was not addressed at all.

This means that Cognex failed to identify *any* HALCON source code that performed the "providing a model" element of claim 1 of the '539 patent.

Additionally, while Dr. Horn identified

he never identified any code in HALCON that receives "the run time image" that is recited in the claim. (A3629 (465: 7-17.)

As a result of these failures, there is insufficient evidence to support a finding of infringement. *See Yoon Ja Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319-20 (Fed. Cir. 2006) (affirming judgment as a matter of law overturning jury's verdict of infringement where expert's conclusory statements did not suffice to meet the patentee's burden of proof).

Additionally, with respect to Respondent Omron, regardless of the level of proof concerning the source code,

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(A4942-43

(1778:25 – 1779:1).) Omron cannot be found to have infringed.

V. THE ITC CORRECTLY CONCLUDED THAT COGNEX HAS WAIVED ANY ARGUMENT FOR INDIRECT INFRINGEMENT

The ITC correctly concluded that Cognex waived any indirect infringement arguments.

Proof of both inducement and contributory infringement requires proof of intent, including proof of knowledge that the combination was both patented and infringing. *Global-Tech Appliances, Inc. v. SEB*, 131 S. Ct. 2060, 2067 (2011). Cognex made no effort to show that MVTec, or any other Respondent, had such intent. None of the passages cited by Cognex from its Post Hearing briefing provides any proof of intent. (App. Br. at 76 (citing A699-700; A709-10; A749-50; A784-86; A873-74).)¹

The ITC was correct in finding these arguments waived.

VI. THE ITC CORRECTLY FOUND THAT THE ASSERTED CLAIMS OF BOTH PATENTS ARE INVALID UNDER 35 U.S.C. § 101 FOR FAILURE TO CLAIM PATENT-ELIGIBLE SUBJECT MATTER.

Cognex's § 101 argument is based entirely on the panel decision in *Research Corporation Technologies, Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010).

¹ As the ITC noted, Cognex's Post Hearing Brief did not even have a section that addressed indirect infringement. (A54 n.11.)

RCT must be read in light of the Supreme Court precedent it follows and which controls—precedent essentially ignored in Cognex’s opening brief. Read in this light, Supreme Court precedent requires a finding of unpatentable subject matter and *RCT* does not (and cannot) require a finding to the contrary.

A. The Cognex Claims Are Unpatentable When Measured Against the Supreme Court’s “Trilogy.”

In its most recent case addressing Section 101, *Bilski*, the Supreme Court instructed lower Courts to use its decisions in *Benson*, *Flook* and *Diehr* as the “guideposts” for patent eligibility. See *Bilski v. Kappos*, 130 S. Ct. 3218 , 3229-31 (2010); *Gottschalk v. Benson*, 409 U. S. 63 (1972), *Parker v. Flook*, 437 U. S. 584 (1978); *Diamond v. Diehr*, 450 U. S. 175 (1981). The Supreme Court also held that the machine or transformation test retained relevance as a “useful and important clue.” *Bilski*, 130 S. Ct. at 3227. The facts of those cases confirm that the Cognex claims are unpatentable.

The Cognex claims, which are simply algorithms that perform calculations on digital images without effecting any real-word result, are like the unpatentable claims presented in *Benson* and *Flook*, and unlike the claims approved in *Diehr*.

As the Supreme Court explained in *Bilski*, the *Benson* Court affirmed the rejection of a patent application for “an algorithm to convert binary-coded decimal numerals into pure binary code,” *Bilski*, 130 S. Ct. at 3230 (citing *Benson*, 409 U.S. at 64-67), explaining that “‘one may not patent an idea,’ but that ‘in practical

effect that would be the result if the formula for converting . . . numerals to pure binary numerals were patented in this case.”” *Id.* (quoting *Benson*, 409 U.S. at 71). Even though the *Benson* claims included underlying computer structure (in claim 8, for example: “storing the binary coded decimal signals . . . in a shift register”), the claims were still an unpatentable algorithm. *Benson*, 409 U.S. at Appendix.

The claims in *Flook* were directed to “a procedure for monitoring the conditions during the catalytic conversion process in the petrochemical and oil-refining industries,” where the “only innovation was reliance on a mathematical algorithm.” *Bilski*, 130 S.Ct. at 3230 (citing *Flook*, 437 U.S. at 585-86). The claim involved gathering data, performing a calculation and updating an alarm limit for a device that generates a warning. *Flook*, 437 U.S. at 585. There surely was an important real world application (perhaps, avoidance of an explosion). But the *claimed* invention was the math—not its potential real world application.

The *Flook* claim, therefore, also was unpatentable under Section 101. Even though the claims “had been limited so that [the invention] could still be freely used outside the petrochemical and oil-refining industries,” they nevertheless were not patent-eligible because once the particular algorithm was removed from consideration, “the application, considered as a whole, contain[ed] no patentable invention.” *Bilski*, 130 S. Ct. at 3230 (quoting *Flook*, 437 U.S. at 589-90 & 594). *Bilski* explained that “*Flook* stands for the proposition that the prohibition against

patenting abstract ideas ‘cannot be circumvented by attempting to limit the use of the formula to a particular technological environment’ or by adding ‘insignificant postsolution activity.’” *Id.* (quoting *Diehr*, 450 U.S. at 191–192).

Together, *Benson* and *Flook* establish that (a) new algorithms (or in Cognex’s words, a “new mathematical model” (App. Br. at 44-45)) for performing computations are not patent-eligible and (b) an algorithm does not become patent-eligible merely because a claim is written to include non-algorithmic limitations that would be insignificant in the absence of the algorithm.

The claims in *Diehr* differed from those presented in *Benson* and *Flook* because they claimed a “previously unknown method for ‘molding raw, uncured synthetic rubber into cured precision products,’ using a mathematical formula to complete some of its several steps by way of a computer.” *Id.* (quoting *Diehr*, 450 U.S. at 177). *Diehr* concluded that “because the claim was not ‘an attempt to patent a mathematical formula, but rather [was] an industrial process for the molding of rubber products,’ it fell within § 101’s patentable subject matter.” *Id.* at 15 (quoting *Diehr*, 450 U.S. at 192–193). In other words, the claims in *Diehr* were patent-eligible because the non-algorithmic elements, reciting the physical steps of molding raw, uncured synthetic rubber *Diehr*, 450 U.S. at 184.

Finally, the claims in *Bilski* itself were directed to a method for hedging risks in commodities trading. *See Bilski*, 130 S. Ct. at 3223-24; *see also* 75 Fed.

Reg., No. 143, at 43926, col. 3 (claims 4 and 7). The Court held that the claims would pre-empt the use of hedging in all fields, and that the dependent claims' additions of statistical techniques and other limitations were insignificant post-solution activity. *Bilski*, 130 S. Ct. at 3231.

Here, Cognex does not even attempt to argue that any particular real world applications are reflected *in the claims*. Instead, Cognex wrongly argues that its "mathematical model" *could* be used in a real world application.

Plainly Cognex's argument must fail. Mechanisms for converting binary coded decimal to pure binary have real world applications. Surely, new mathematical models for calculating alarm conditions in a petrochemical plant have real world applications. $E=mc^2$, Euler's law, the Pythagorean theorem, Newton's law and formulas for hedging risk all have real world applications. But to say that performing these calculations is patentable because one *could* apply them in the real world afterwards would do impermissible violence to Supreme Court precedent.

B. The Claims of the '539 and '262 Patents Are Not Directed to Eligible Subject Matter

Claim 1 of the '539 patent recites a method for determining the presence or absence and location of a pattern in an image that includes the steps of "providing a model . . .," "providing the run-time image," "comparing the model with the run-time image . . .," "computing a match score . . .," "locating local maxima . . .,"

“comparing the magnitude of each local maxima...,” and “returning the location of each local maxima....” (A262.) Claim 1 of the ’262 patent recites similarly abstract steps. (A310.)

None of these are anything more than steps in an abstract calculation, as the claim does not recite any particular hardware that implements them, or anything in the real world that is changed as a result of this sequence of steps. All of the claim elements are simply math or data manipulation. *See Benson*, 409 U.S. at 67 (explaining that a mathematical formula (i.e., “computing”) is not patentable).

Cognex makes three unhelpful arguments on appeal. First, Cognex argues that the claims are patentable because they could be applied to the real world, e.g., for inspection of manufacturing processes, as the Cognex PatMax and PatQuick products are allegedly used. This cannot render the claims patentable, however, because (i) none of those applications are in the claim, and (ii) if it were true, the Supreme Court would necessarily have decided *Flook* differently, as alarm conditions at plants are certainly a very real world application.

Second, Cognex argues that the recitation of “image” makes the claims patentable. At best, however, this argument *could* make the claims more like *Flook*, where the application described a procedure for taking measurements and monitoring the conditions of a specific physical process, including calculating and adjusting an alarm limit, but the claims still were unpatentable because, aside from

the algorithm, they recited nothing new. Here, the receipt of a run-time image is old and well-known and, therefore, precisely the type of “insignificant post-solution activity” or “data gathering” that is insufficient to render patentable the algorithms to which the claims are actually directed.

Put another way, if the unpatentable abstract idea of a particular algorithm to process an image is removed, there is nothing new left. *See Bilski*, 130 S. Ct. at 3230 (“once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention”) (quoting *Flook*, 437 U.S. at 594).

C. *RCT* Did Not Set Forth Any New Test, Cannot Be Interpreted to Conflict with Supreme Court Precedent, and Is Distinguishable from Cognex’s Claims

Cognex attempts to rely on *RCT* to the exclusion of the Supreme Court’s guidepost cases.² In *RCT*, however, the Federal Circuit made clear that it was not defining the term “abstract” and instead relied on *Benson*, *Flook*, *Diehr*, and *Bilski*, cases compelling a finding of unpatentable subject matter here. *RCT*, 627 F.3d at

² Cognex’s only analysis of *Benson* and *Bilski* is an argument that unlike those cases, the ITC supposedly did not “articulate” a “broad” idea. (App. Br. at 41.) Cognex mistakes broadness with abstractness, fails to mention the abstract idea in *Flook* (a mathematical algorithm, like Cognex’s claims), and fails to mention that the abstract idea of Cognex’s claims can be articulated as algorithms that perform calculations on digital images, similar to the abstract ideas in *Benson* and *Flook*, as expressed, for example, in the ID. (A107.)

867-69. Cognex incorrectly attempts to interpret *RCT* in a manner that conflicts with the Supreme Court guidepost cases.

In any event, *RCT* is distinguishable because the claims in that case were all construed to “produce a halftone image.” *Id.* at 864; *see also id.* at 865 (“[the] inventive mask produces higher quality halftone images”); *id.* at 868 (“the subject matter is a ‘process’ for rendering a halftone image.”); *id.* (“The ‘310 and ‘228 patents claim methods … for rendering a halftone image.”).³ The *RCT* court concluded that because these methods produced a halftone image, they were not abstract (and presumably also satisfied the transformation prong of the machine-or-transformation test, as the district court had concluded) and therefore were not invalid under § 101. *Id.* at 868. Cognex’s claims do not produce a half-tone image, or anything else in the real world, and contain no similarly transformative step.

In application, the methods of Cognex’s claims may be used in a software product, such as PatMax and PatQuick, as Cognex asserts. (App. Br. at 39.) That

³ The district court in *RCT* divided the claims, finding those that explicitly included the element “produc[ing] a halftoned image” satisfied the transformation prong of the machine-or-transformation test, while the claims that did not include that element failed the test. *Research Corporation Technologies, Inc. v. Microsoft Corp.*, 2009 U.S. Dist. LEXIS 71883, at *45-46 (’941 and ’518 patents) & *52 (’305 patent) (D. Az. July 28, 2009). The Federal Circuit instead found that all the claims produced a half-tone image, whether that element was explicitly in the claim or not.

does not make the claimed subject matter less abstract, however. Any of the techniques in *Benson*, *Flook*, and *Bilski* could also be implemented in the marketplace and perhaps were, all certainly have real world applications, and all are commercially meaningful.

Indeed, the *RCT* court determined that algorithms and formulas were a “significant part” of the methods in the patents in *RCT*, but not the entire method. *Id.* at 869. In contrast, *every* step in Cognex’s claims is an algorithmic step, and therefore even viewing the steps “as a whole,” the claims recite nothing more than a series of calculations, that is, nothing more than what Cognex aptly describes as a “mathematical model.” (App. Br. at 44-45.)

D. The Claims Do Not Pass the Machine-or-Transformation Test

In *Bilski*, the Supreme Court made clear that the machine or transformation test remains a “useful and important clue.” *Bilski*, 130 S. Ct. at 3227. Cognex does not argue that the transformation prong is satisfied, and there is no machine. The patent *claims* are directed to image processing algorithms. There are no machines or cameras to be found *in the claims*, and the word “machine vision” never even appears in the patents. The fact that an (unpatentable) algorithm may be implemented on a general purpose computer does not impart patentability here any more than it did in *Benson* (where the claims actually recite a shift register, i.e., a specific piece of hardware).

Desperate to find a machine in the claims, Cognex argues that the term “image” is “defined” in the ’539 patent to have a long and complicated meaning that Cognex asserts ties it to a machine. (App. Br., at 42.)

MVTec did not believe it necessary to construe “image” in these image processing patents, and neither did the Staff nor, ultimately, the ITC. (A7; A37-50.) For its part, Cognex cannot explain why the term “image” should be construed to include its lengthy proposed definition.

In any event, even if “image” is construed as Cognex requests, it *still* fails to render the claims patent-eligible. This is because “image” would not be a particular machine; rather, it would be a “2-dimensional function” (i.e., a data construct) that merely *could* be generated by an image processing device.

The “device” in Cognex’s definition is only involved in capturing the 2-dimensional function that is then manipulated by the claimed algorithm. This is a classically unpatentable “extra-solution” or “data gathering” step, as discussed above.

Additionally, Cognex’s construction of “image” does not require that it represent anything real, as it may be a “2-dimensional function . . . whose values correspond to ***simulated characteristics of an object.***” (A244 (3:66–4:5.) Thus, not only is the “image” a mathematical “function” (a 2-D array of numbers), as opposed to a physical thing, but it can be “simulated.” Indeed, Cognex’s expert

compared a *synthetic* model to a *synthetic* image in an attempt to show how HALCON works. (A3772-75 (608:16 – 611:8).)

Finally, Cognex also argues that the terms “automatically” ('539 patent, claim 18) and “filtering” and “sub-sampling” ('262 patent, claim 12) refer to the execution of software by a computer. These arguments cannot save the *other* claims. Moreover, again, the fact the claimed algorithms *may* run on a computer, or *may* run in a system that includes a computer, does not mean that they are “tied to a particular machine.” To the contrary, recitation in the claim of a “shift register” did not rescue patentability of the claims in *Benson*. Also, with respect to “automatically,” it would be “automatic,” for example, if the granularity was always, say 1/10 of the largest dimension of the image, and no computer would be required to compute it. Similarly, neither “filtering” nor “sub-sampling” requires any particular hardware, but instead are also just algorithms.

VII. IF THE COURT REVERSES ALL OF THE CLAIM CONSTRUCTIONS, THE '539 PATENT IS INVALID

For the reasons stated above, if the Court affirms any of the disputed claim constructions, the ITC’s finding of non-infringement must be affirmed. In fact, even if the Court finds that the ITC incorrectly construed every disputed term, the ITC’s finding of non-infringement should be affirmed because two of the bases do not depend on a disputed claim construction or contested fact finding. (See Section II above).

Additionally, if the Court determines that the ITC incorrectly construed terms, then the '539 patent is invalid based on six different prior art references, Jain (A6242-53; A6254-65), Hashimoto (A6266-77), Perkins (A6278-86; A6287-95), Olson (A6296-306; A6307-17), Borgefors (A6318-34; A6335-51) and Yamada (A6352-60; A6361-69).⁴ The reasons are fully set forth in MVTec's Post-Hearing Briefing, supported by the testimony of Dr. Forsyth, cited below. (A5494-5529; A5631-46.)

As an example, the Perkins reference anticipates claim 1 of the '539 patent under Cognex's construction.

Perkins meets the preamble of claim 1. (A4598-99 (1434:9 – 1435:8; A6287 (portion marked “A”); A6278 (col. 2).) Perkins provides a model (A4599-601 (1435:9 – 1437:18); A6288 (portion “B”) & A6289 (the portions marked “C” and “D”); A6279 (col. 2); A6280 (col. 2)) and a run-time image (A4601-02 (1437:19 – 1438:4); A6287 (portion “A”); A6278).

Perkins also meets the “comparing the model with run-time image” limitation. (A4602-03 (1438:5 – 1439:11); A6289 (portions “E,” “C,” and “D”); A6280) and, after comparing the model with the image Perkins computes a match

⁴ If the Court concludes that there was infringement, however, the better option would be to remand for determinations of invalidity under the new claim constructions. *See Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 457 F.3d 1293, 1304-05 (Fed. Cir. 2006).

score, as claimed (A4603 (1439:12-24); A6289 (the portions marked “C” and “D”); A6280 (col. 2)). This disclosure is quite explicit, too. Perkins’ computation is performed by testing whether the angular difference between the model and image directions is small enough (i.e., within $\pm\Delta\Phi$), and, if this is the case, incrementing the match score by 1 to get the “total number of multisectors which are matched.” (A4633-34 (1469:8 – 1470:11); A6289 (the portion marked “C”); A6280.) This is just like the test applied in the ’539 patent, were “test” read more broadly than using a rating factor function.

Perkins then meets the “locating local maxima” limitation (A4603-04 (1439:25 – 1440:11); A6289 (the portion marked “F”); A6280) and the “accept threshold” limitation (A4604-05 (1440:12 – 1441:25); A6292 (the portion marked “G”); A6283 (Section III(D))). The match score is “the number of multisectors matched,” and the accept threshold is a percentage of matched multisectors, which is 34 percent (or 38 multisectors matched). (A4636-37 (1472:14 – 1473:20).)

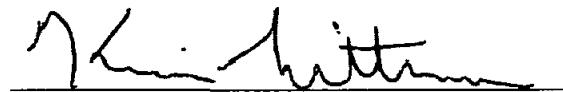
Finally, Perkins also meets the “returning location” limitation. (A4604-05 (1440:12 – 1441:25); A6287 (the portion marked “A”); A6278.)

Thus, Perkins clearly and convincingly invalidates the claims of the ’539 patent under Cognex’s broad constructions.

CONCLUSION

For the reasons set forth above, Intervenors respectfully request that the Final Determination of the ITC was correct and should be affirmed.

Respectfully submitted,



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Dated: August 3, 2011

*Attorneys for Intervenors MVtec
Software GmbH and MVtec LLC*

**United States Court of Appeals
for the Federal Circuit**

COGNEX CORP v ITC, 2011-1098

CERTIFICATE OF SERVICE

I, John C. Kruesi, Jr., being duly sworn according to law and being over the age of 18, upon my oath depose and say that:

Counsel Press was retained by FOLEY & LARDNER LLP, Attorneys for Intervenors to print this document. I am an employee of Counsel Press.

On the **3rd Day of August, 2011**, I served the within **Brief for Intervenors (confidential and non-confidential versions)** upon:

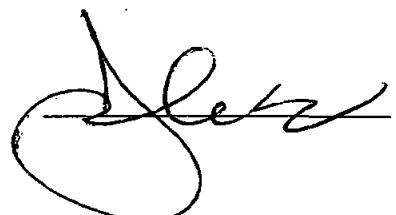
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via Federal Express, overnight delivery, by causing 2 true copies of each to be deposited, enclosed in a properly addressed wrapper, in an official depository FedEx.

Unless otherwise noted, 12 confidential copies and 5 non-confidential copies have been hand-delivered to the Court on the same date as above.

August 3, 2011



**United States Court of Appeals
for the Federal Circuit
COGNEX CORP v ITC, 2011-1098**

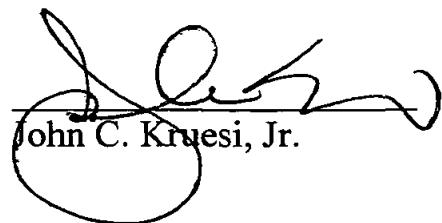
**DECLARATION OF AUTHORITY PURSUANT TO
28 U.S.C. § 1746 AND FEDERAL CIRCUIT RULE 47.3(d)**

I, John C. Kruesi, Jr., being duly sworn according to law and being over the age of 18, upon my oath depose and say that:

I am an employee of Counsel Press's Washington DC Office. Counsel Press was retained by Attorneys for Intervenors to print the enclosed documents.

The attached brief has been submitted to Counsel Press, by the above attorneys, electronically and/or has been reprinted to comply with the Court's rules. Because of time constraints and the distance between counsel of record and Counsel Press, counsel is unavailable to provide an original signature, in ink, to be bound in one of the documents. Pursuant to 28 U.S.C. §1746 and Federal Circuit Rule 47.3(d), I have signed the documents for Kevin M. Littman, with actual authority on his behalf as an attorney appearing for the party.

August 3, 2011



John C. Kruesi, Jr.

CERTIFICATE OF COMPLIANCE

The Intervenors' brief is submitted in accordance with Rule 32(a)7(B)(ii) of the Federal Rules of Appellate Procedure. The brief contains 13,997 words, as determined by Microsoft Word.

Dated: August 3, 2011



Matthew B. Lowrie
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